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09/932,497

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George Seaver

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12/28/2004

PATENT LAW OFFICE OF DAVID G. BECK

P. O. BOX 1146

MILL VALLEY, CA 94942

EXAMINER

KIM, DAVID S

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/932,497

Applicant(s)

SEAVER, GEORGE

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-15,18-26,31 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-15,18-26,31 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Applicant's compliance with the rejections of claims 5, 9, 22, and 27-30 in the previous Office Action (mailed 15 July 2004) is noted and appreciated. Applicant's amendments to claims 5, 9, and 22 and Applicant's cancellation of claims 27-30 obviate the previous rejections. Accordingly, the previous rejections are withdrawn.

Claim Rejections - 35 USC § 101

2. Applicant's compliance with the rejections of claims 27-30 in the previous Office Action (mailed 15 July 2004) is noted and appreciated. Applicant's cancellation of claims 27-30 obviates the previous rejections. Accordingly, the previous rejections are withdrawn.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 4, 6-7, 14-15, and 18-20** are rejected under 35 U.S.C. 102(b) as being anticipated by Seaver (U.S. Patent No. 6,034,811).

Regarding claim 1, Seaver discloses:

A system for tracking and regulating an optical beam, comprising:

a) at least one solid-state optical beam regulator (37 and 38 in Fig. 10) comprising at least one stress-optic refractor (38), said optical beam passing through said at least one optical beam regulator;

b) an optical sensing device (detector 42);

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c) a computer (microprocessor 44) for calculating control signals using beam information from the optical sensing device, wherein said control signals control said at least one optical beam regulator.

Regarding claim 4, Seaver discloses:

The system of claim 1 wherein said at least one beam regulator is capable of two-dimensional (horizontal and vertical actuator 38) steering.

Regarding claim 6, Seaver discloses:

The system of claim 1 wherein said at least one beam regulator acts as a lens to re-focus the beam or return the beam to a collimated state (note various embodiments in Figs. 1-8).

Regarding claim 7, Seaver discloses:

The system of claim 1 wherein said at least one solid-state optical beam regulator is comprised of two one-dimensional stress-optic refractors in series (Fig. 3).

Regarding claim 14, Seaver discloses:

The system of claim 1 wherein said at least one beam regulator can function at frequencies greater than 1 kHz (e.g., col. 1, l. 58-60).

Regarding claims 15 and 18-20, claims 15, 18, 19, and 20 are system claims that correspond to system claims 1, 4, 6, and 7, respectively. Therefore, the recited means in system claims 1, 4, and 6-7 read on the corresponding means in system claims 15 and 18-20.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 5, 11, and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver as applied to claims 1 and 15 above, and further in view of Javitt et al. (U.S. Patent No. 6,381,055 B1, hereinafter "Javitt").

Regarding claim 5, Seaver discloses:

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The system of claim 1 wherein the optical sensing device monitors a portion of an optical beam from a target (reference beam 41 in Fig. 10).

Seaver does not expressly disclose:

The system of claim 1 wherein the optical sensing device monitors a portion of *the* optical beam *reflected* from a target.

Rather, Seaver teaches a system that monitors a reference beam from a target to align optical transmissions to that target (col. 7, l. 31-39). However, the practice of monitoring a portion of an optical beam that is *reflected* from a target is known in the art. Javitt teaches such monitoring (Fig. 5A). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the monitoring of Javitt so that the optical sensing device of Seaver monitors a portion of *the* optical beam *reflected* from a target. One of ordinary skill in the art would have been motivated to do this since the monitoring of Javitt provides additional benefits, such as enabling the two stations of Seaver to align optical transmissions with each other when the each of the stations do not know the location of its counterpart station (Javitt, col. 8, l. 41-62) and providing a safety mode for protecting people from harmful doses of electromagnetic radiation (Javitt, col. 11, l. 56 – col. 12, l. 34). Moreover, the use of a *reflected* beam also reduces the need for the reference beam from the target of Seaver, allowing one to save power.

Regarding claim 11, Seaver in view of Javitt discloses:

The system of claim 1 wherein the computer receives information about the beam's position from the optical sensing device, calculates the beam's displacement from a reference position, and then sends steering signals to the beam regulator, so as to steer the beam toward the reference position (Seaver, col. 7, l. 33-39; Javitt, e.g., col. 11, l. 12-30).

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Regarding claim 24, claim 24 is a system claim that corresponds to system claim 11. Therefore, the recited means in system claim 11 read on the corresponding means in system claim 24.

7. **Claims 8-10 and 21-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver as applied to claims 1 and 15 above, and further in view of Shelby (U.S. Patent No. 5,953,146).

Regarding claim 8, Seaver does not expressly disclose:

The system of claim 1 wherein the optical sensing device is a CMOS imaging device.

However, CMOS imaging devices are known to be used in systems for tracking and regulating an optical beam. Shelby teaches such an imaging device (Fig. 2B, col. 1, l. 6-8, col. 5, l. 54-60). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ a CMOS imaging device of Shelby in the system of Seaver. One of ordinary skill in the art would have been motivated to do this since CMOS image devices provide advantages over other types of optical sensing devices. For example, in comparison to CCD devices and quad sensors, CMOS image sensors have faster data recovery times (col. 6, l. 48-67). CMOS image sensors also minimize the effect of noise signals (col. 7, l. 1-6).

Regarding claim 9, Seaver in view of Shelby discloses:

The system of claim 1 wherein the optical sensing device senses a region of interest that is less than a full frame (Shelby, col. 5, l. 63 – col. 6, l. 26).

Regarding claim 10, Seaver in view of Shelby discloses:

The system of claim 1 wherein the optical sensing device provides beam position (Seaver, col. 7, l. 33-39) and shape (Shelby, col. 7, l. 11 – col. 9, l. 9) information to the computer and thence to the regulator at speeds greater than 1 kHz (Seaver, e.g., col. 1, l. 58-60).

Seaver in view of Shelby does not expressly disclose:

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The system of claim 1 wherein the optical sensing device provides beam position and shape information to the computer and thence to the regulator at *position accuracies better than 1 microradian*.

However, such position accuracies are known in the art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to achieve such position accuracies since it has been held that discovering optimum or workable ranges by routine experimentation is not inventive when general conditions of a claim are disclosed in prior art. *In re Aller, Lacey, and Hall, 105 USPQ 233 (CCPA 1955)*.

Regarding claims 21-23, claims 21, 22, and 23 are system claims that correspond to system claims 8, 9, and 10, respectively. Therefore, the recited means in system claims 8-10 read on the corresponding means in system claims 21-23.

8. **Claims 12 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver in view of Javitt as applied to claim 5 above, and further in view of Shelby.

Regarding claim 12, Seaver in view of Javitt does not expressly disclose:

The system of claim 1 wherein the computer receives information about the beam's *size and shape* from the optical sensing device, calculates the beam's deviation from *desired collimation*, and then sends *shaping* signals to the beam regulator, so as to *shape* the beam toward the *desired collimation*.

Rather, Seaver in view of Javitt teaches the usage of information about the beam's *position* and a *reference position*. However, a beam's size and shape is known to be able to convey additional information to an optical sensing device for the purpose of shaping the beam toward a desired collimation. Shelby teaches such conveyance of information through CMOS imaging devices (Fig. 2B, col. 7, l. 11 – col. 9, l. 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ a CMOS imaging device of Shelby in the system of Seaver in view of Javitt. One of ordinary skill in the art would have been

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motivated to do this since CMOS image devices provide advantages over other types of optical sensing devices. For example, in comparison to CCD devices and quad sensors, CMOS image sensors have faster data recovery times (col. 6, l. 48-67). CMOS image sensors also minimize the effect of noise signals (col. 7, l. 1-6). Additionally, adjusting a beam's shape affects alignment accuracy, and the CMOS image sensor of Shelby aids in directing such adjusting of a beam's shape to improve alignment accuracy (col. 7, l. 37-38, 48-60, col. 8, l. 1-18).

Regarding claim 25, claim 25 is a system claim that corresponds to system claim 12. Therefore, the recited means in system claim 12 read on the corresponding means in system claim 25.

9. **Claim 13 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver.

Regarding claim 13, Seaver discloses:

The system of claim 1 wherein the system steers the beam in two dimensions (horizontal and vertical actuator 38).

Seaver does not expressly disclose:

The system of claim 1 wherein the system steers the beam *at microradian accuracy*.

However, such position accuracies are known in the art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to achieve such position accuracies since it has been held that discovering optimum or workable ranges by routine experimentation is not inventive when general conditions of a claim are disclosed in prior art.

In re Aller, Lacey, and Hall, 105 USPQ 233 (CCPA 1955).

Regarding claim 26, claim 26 is a system claim that corresponds to system claim 13. Therefore, the recited means in system claim 13 read on the corresponding means in system claim 26.

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10. **Claims 31-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seaver in view of Mongeon (U.S. Statutory Invention Registration No. H341).

Regarding claim 31, Seaver does not expressly disclose:

The system of claim 1, further comprising:

means for transmitting a beacon beam, said beacon beam passing through said at least one optical beam regulator; and

means for directing said beacon beam onto said optical sensing device after said beacon beam has passed through said at least one optical beam generator.

However, the use of beacon beams is well known in the art. Often, beacon beams are used to acquire and track a target. Mongeon teaches the use of such a beam (Fig. 2, col. 1, l. 9-32). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include the beacon beam teachings of Mongeon (that correspond to the said means for transmitting (Mongeon, laser indicated in Fig. 2) and said means for directing (Mongeon, Fig. 2, optical duplexer 21 in Fig. 2)) in the system of Seaver. One of ordinary skill in the art would have been motivated to do this since Seaver is silent about how each of two stations of Fig. 10 initially acquires each other's position. That is, the tracking feature of Seaver can only occur if each of the two stations has acquired each other's position. A beacon beam, as taught by Mongeon, is a conventional teaching used to provide such desirable acquisition so that the tracking feature of Seaver can be practiced.

In the case that the "means for directing" language is read to also include mirror 14 and lens 16 in Applicant's Fig. 2, Examiner considers such additional optical elements to be extremely common and conventional to employ in Seaver in view of Mongeon. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include such a mirror and lens in the system of Seaver in view of Mongeon. One of ordinary skill in the

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art would have been motivated to do this for design flexibility; a mirror is the conventional way to redirect an optical signal to a desired location, and a lens is the conventional way to focus an optical signal onto a desired target.

Regarding claim 32, claim 32 is a system claim that corresponds to system claim 31. Therefore, the recited means in system claim 31 read on the corresponding means in system claim 32.

Response to Arguments

11. Applicant's arguments with respect to the amendments to independent claims 1 and 15 have been considered but are moot in view of the new ground(s) of rejection. The present set of rejections relies on Seaver as the primary reference.

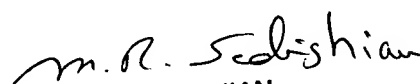
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK


M. R. SEDIGHIAN
PRIMARY EXAMINER